41 Improper fractions and mixed fractions

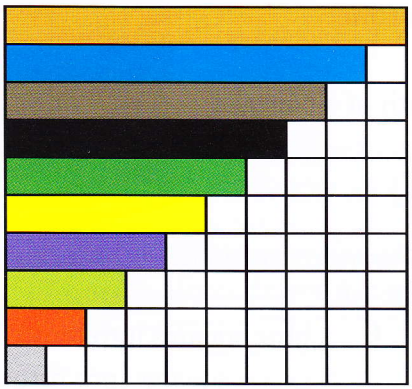
We are learning to find where fractions live amongst whole numbers.

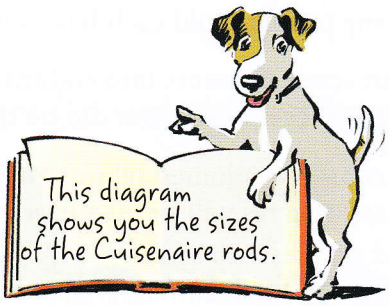
NUMBER KNOWLEDGE

Numeracy Book 4
- Number Mats and Number Fans
- Non-unit Fractions
- Packets of Lollies
- Bead Strings
- Bowl a Fact

In *this* book
- Multiplication and division basic facts ..... page 204
- Identifying fractions ... page 209
- Ordering fractions ..... page 240

Cuisenaire rods or fractions strips.
(Note: You could join Multilink cubes together to make coloured rods.)





Example Tipani was making tile patterns with Cuisenaire rods.
He made this pattern with orange and yellow rods.

a If an orange rod is one whole, how big is a yellow rod?

Two yellow rods make one whole orange rod.
A yellow rod is $\frac{1}{2}$.

b How many yellow rods would Tipani need to make five whole orange rods?

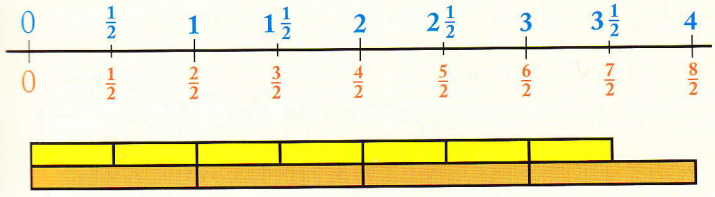
Ten yellow rods will be the same length as five orange rods.
10 halves make 5 wholes.

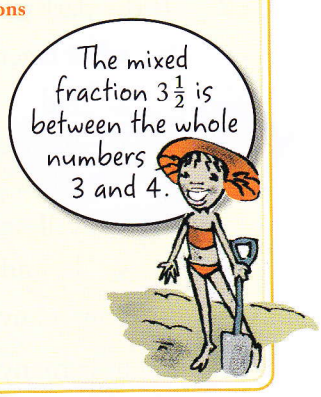
$$\mathbf{10} \times \frac{1}{2} = \frac{\mathbf{10}}{2} = 5$$

Tipani will need **10** yellow rods.

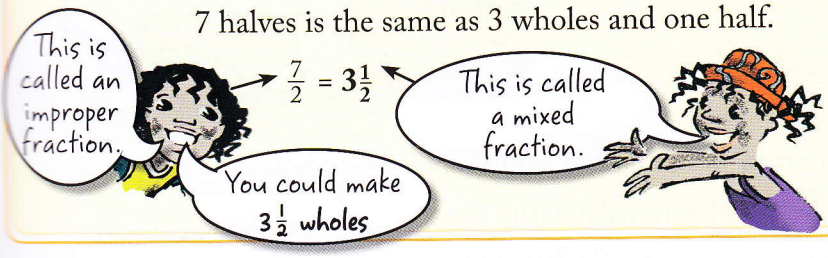
Rename improper fractions as mixed fractions using materials with multiplication and position improper fractions on the number line.
Trains Book 7

c How many wholes could you make with seven yellow rods?





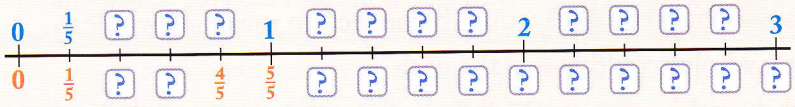
7 halves is the same as 3 wholes and one half.

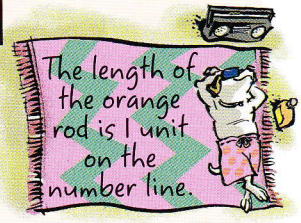


Rods

1 a If an orange Cuisenaire rod is one whole, what fraction of a whole is a red rod? How do you know?

b Copy and finish this number line and diagram to find out how many red rods you would need to make three wholes.



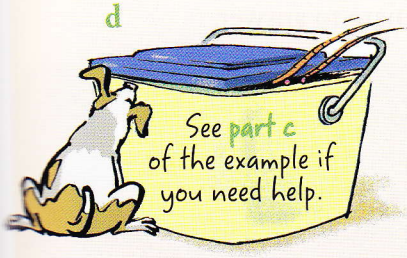


c Write an equation like the one Millee is pointing to in part b of the example on the previous page.

d Extend your number line so that it goes up to 4.
Use your number line to find how many wholes you could make with

i 14 red rods ii 9 red rods iii 17 red rods

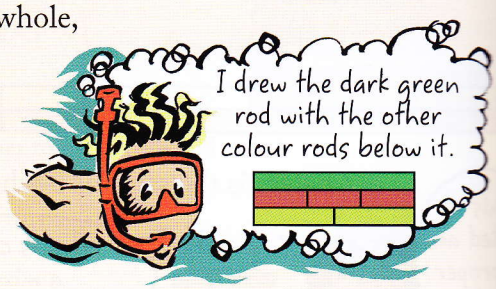
Write your answers as improper fractions and as mixed fractions.



e Explain to a classmate and write down what an improper fraction is and why it is called this.
Do the same for a mixed fraction.

For each of questions 2 and 3, draw a double number line and diagram like the ones in question 1b.
Write equations for part c of each question.

2 If the dark green Cuisenaire rod is one whole,



a what fractions of a whole are these?
- i red
- ii light green
- iii white
- iv yellow
- v lavender

b how many white rods would be needed to make four wholes?

c how many wholes could you make with
- i 14 red rods?
- ii 7 white rods?
- iii 9 yellow rods?
- iv 12 lavender rods?

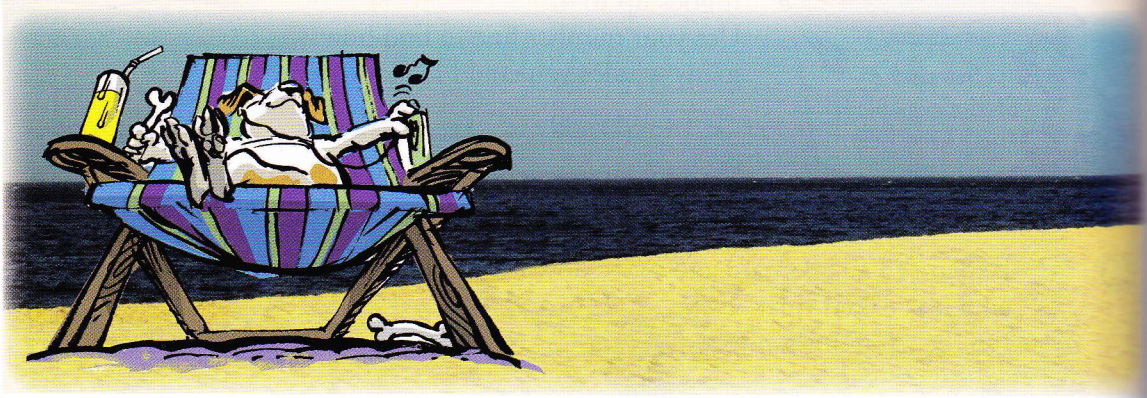
3 If the red rod is $\frac{1}{2}$,

a what fractions are these colour rods?
- i brown
- ii dark green
- iii white
- iv light green
- v yellow

b How many light green rods would be needed to make six wholes?

c how many wholes could you make with
- i 15 white rods?
- ii 11 light green rods?
- iii 7 dark green rods?

4 Use the Cuisenaire rods.
Choose a colour rod to be one whole.
Write down what every other colour is as a fraction of this whole.
Make up some questions like question 3 for a classmate to answer.

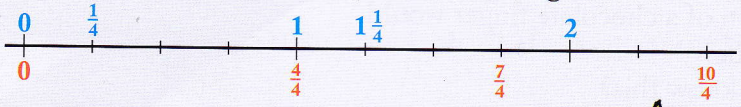


Rename improper fractions as mixed fractions using materials with multiplication and position improper fractions on the number line
Trains Bundle

Activity

1 Sam had 9 quarters of orange left after his rugby game.

a Copy and fill in this double number line to show how many whole oranges can be made with the 9 quarters of orange.



b Write an equation to record your answer.

2 How many pizzas would each of these give? Write equations to show your answers.

a 5 thirds of a pizza

b 7 quarters of a pizza

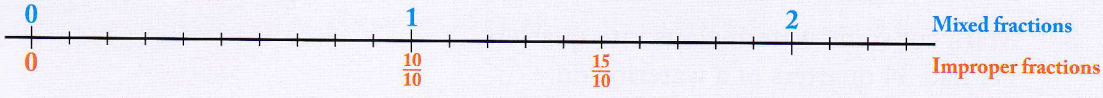
c 12 fifths of a pizza

d 27 eighths of a pizza

3 *Challenge*

Millee ate 5 thirds of muesli bar and Sam ate 7 thirds of muesli bar. How many muesli bars did they eat altogether?

4 Copy this double number line into your book.



a Put these improper fractions and mixed fractions onto your number line.

$1\frac{1}{2}$ $2\frac{3}{10}$ $\frac{11}{10}$ $\frac{16}{10}$ $\frac{7}{5}$

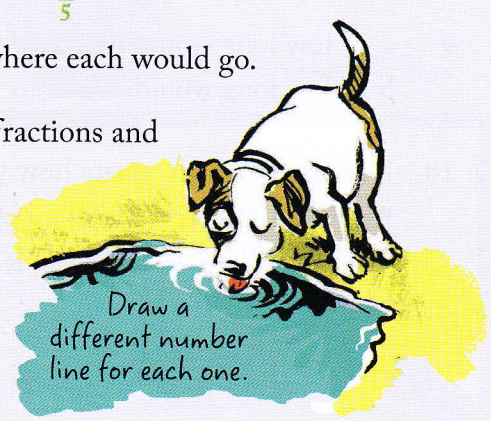
b Explain to a classmate how you decided where each would go.

5 Draw a number line and put these improper fractions and mixed fractions on it.

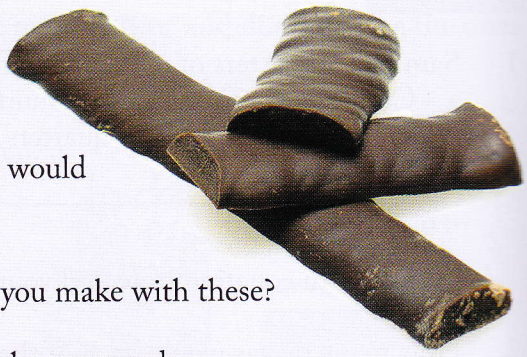
a $\frac{11}{5}$, $1\frac{1}{5}$, $\frac{8}{5}$, $2\frac{4}{5}$

b $\frac{8}{3}$, $3\frac{1}{3}$, $\frac{11}{3}$, $2\frac{1}{3}$

c $\frac{7}{6}$, $1\frac{5}{6}$, $\frac{9}{6}$, $1\frac{1}{3}$



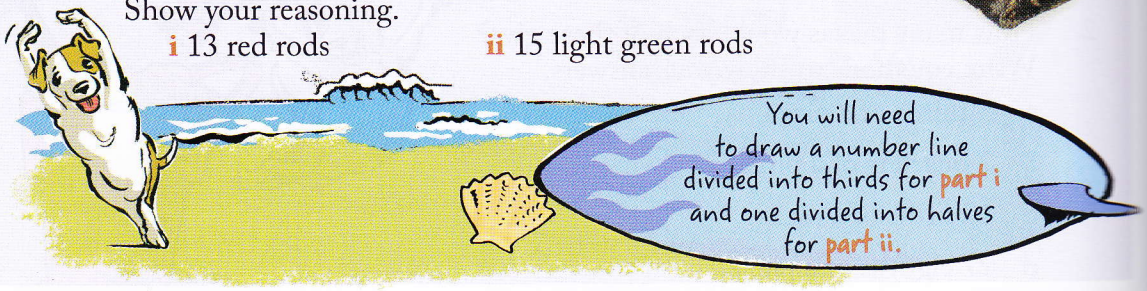
6 Matthew was playing a game with his brother, using Cuisenaire rods. They pretended that the dark green rod was one whole chocolate finger.



a What fraction of a chocolate finger would the red rods be?
How do you know this?

b How many chocolate fingers could you make with these?
Show your reasoning.

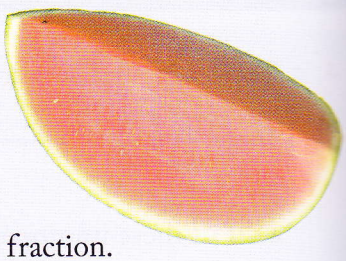
i 13 red rods **ii** 15 light green rods



7 Challenge

Chanel said that 34 tenths is the same as $3\frac{4}{10}$ so 74 ninths is the same as $7\frac{4}{9}$.
Is she correct? Justify your answer.

For questions 8 and 9 record your answers on a number line or with equations.



8 Mark cut some watermelons into quarters.
He had 34 quarters of a watermelon.
How many watermelons did he cut up?
Write your answer as an improper fraction and a mixed fraction.

9 **a** How long would it take to watch a half-hour video seven times?

b How long would it take to watch a quarter-hour video five times?

10 Discuss with a classmate how you could change these into mixed fractions without drawing a diagram or number line.
Write down the answers.

a $\frac{15}{4}$ **b** $\frac{17}{3}$ **c** $\frac{20}{5}$ **d** $\frac{37}{6}$ **e** $\frac{58}{10}$

f $\frac{45}{4}$ **g** $\frac{56}{9}$ **h** $\frac{82}{10}$ **i** $\frac{61}{5}$ **j** $\frac{67}{8}$

Rename improper fractions as mixed fractions using materials with multiplication and position improper fractions on the number line.
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11 Discuss how you could change these into improper fractions without drawing a diagram or double number line.
Write down the answers.

a $2\frac{1}{2}$	**b** $4\frac{2}{5}$	**c** $3\frac{1}{6}$	**d** $8\frac{2}{7}$	**e** $6\frac{3}{4}$
f $9\frac{3}{5}$	**g** $10\frac{5}{9}$	**h** $12\frac{2}{3}$	**i** $15\frac{3}{8}$	**j** $13\frac{5}{6}$

12

Ms Baker had a birthday party.

a She made a huge birthday cake.
The recipe needed $10\frac{2}{3}$ cups of flour and $7\frac{1}{3}$ cups of sugar.
Ms Baker only had a third cup measure.
How many third cups of flour and third cups of sugar did she need?

b At the end of the party there were 17 eighths of chocolate log left.
How many chocolate logs is this?

13 Work with a partner.
Choose one person to be **person A** and the other to be **person B**.
Who has the most of each of these? Justify your answer to your partner.

a

Person A
has $3\frac{3}{4}$ pizzas.

Person B
has 15 quarters of pizzas.

b

Person A
has $5\frac{2}{3}$ cakes.

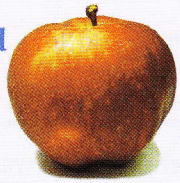
Person B
has 19 thirds of cakes.

c

Person A
has $9\frac{3}{5}$ pineapple rings.

Person B
has 50 fifths of pineapple rings.

d



Person A
has $7\frac{5}{6}$ apples.

Person B
has 45 sixths of apples.

14 Challenge

At the inter-school netball, the teams were given orange quarters at each break.
After the first break, pool A had 14 quarters left and pool B had $5\frac{3}{4}$ oranges left.

a How many quarters were left altogether?

b 15 oranges were needed at the next break.
How many more oranges were needed?